



Application Of A Scientific Approach To Improve Learning Outcomes In The Mini Volleyball Game (Classroom Action Research on Grade VI Students of SD Negeri 72 Lubuklingau Academic Year 2022/2023)

Received : December 25, 2023

Revised : January 12, 2024

Accepted: January 17, 2024

Publish : January 28, 2024

Ahmad Mahendra Adiputra*, Hotlinder H Simamora

Abstract:

The aim of this research is to apply a scientific approach to improve learning outcomes in the game of mini volleyball for class VI students at SD Negeri 72 Lubuk Linggau in 2023. Classroom Action Research uses an approach that lasts 2 cycles, each cycle has one meeting consisting of planning, implementing actions, observing and reflecting. The research subjects were 32 students in class V I of SD Negeri 72 Lubuklinggau , with 15 male students and 17 female students . While the data collection methods used were observation and performance tests, data processing used descriptive percentages. Student learning outcomes increased in cycle I with an average score of 68 and increased in cycle II with an average student score of 83. Likewise, the percentage of students who succeeded in each cycle also increased. With a percentage of success results of 47% (15 students) in cycle I then 94% (30 students) in cycle II. Thus, it can be concluded that the scientific approach can improve the learning outcomes of the mini volleyball game in class V I students at SD Negeri 72 Lubuklinggau in the 2022/2023 academic year . The suggestion is that a scientific approach should be an alternative choice in playing mini volleyball for physical education and health teachers.

Keywords: Classroom Action Research, Mini Volleyball, Scientific Approach

1. INTRODUCTION

Sports education is a form of education in general , as explained in (Opstoel et al., 2019) that one area of education that emphasizes life development and physical exercise is physical education, sports, and health, all of which are taught at a certain school level. wholesome for development and the balanced, harmonic, and harmonious growth of the physical, mental, social, and emotional domains.

In the educational process and achieving educational goals. Sport plays a very important role because in Physical Education material, Sports and Health can directly develop/build the physical body so that it is healthy and strong (Barbu et al., 2020). Volleyball is a fun game where people in rural and urban areas, adults and older people for fun bounce the volleyball back and forth in the air over the net (Zhe & Suparjoh, 2023). Without a net , even a rope can be used to separate the field.

Publisher Note:

CV Media Inti Teknologi stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright

©2024 by the author(s).

Licensee CV Media Inti Teknologi, Bengkulu, Indonesia. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-ShareAlike (CC BY-SA) license (<https://creativecommons.org/licenses/by-sa/4.0/>).

At the school level, in this case elementary school, middle school and middle school , the material for the sport of volleyball has been included in the Physical Education, Sports and Health curriculum so that this sport must be taught to students at school (Stojanović et al., 2023). Volleyball is a team game, involving more than one player so that the game can run well (Batez et al., 2021). Each player from each team must have skills in playing volleyball, besides that, good cooperation is also needed to win a match.

The limited amount and quality of learning facilities and infrastructure that schools have to offer is one of the issues preventing the growth of the PJOK (Physical Sports and Health Education) curriculum (Rosadi et al., 2018). In this way, the potential of students will certainly not develop optimally so that in the end it will be less than optimal in supporting and contributing potential athletes who can be developed in coaching sports achievements after moving to the level of development and growth. PJOK Playing mini volleyball matches at the primary school level is one way to address the issue of inadequate infrastructure and instructional resources in schools (Megawati et al., 2023).

The aforementioned issues lead to the conclusion that, in order to make learning engaging and enjoyable while also supporting students' personal development, a Mini Volleyball learning game is required. Naturally, a variety of supporting elements are required to meet the objectives of physical education, such as infrastructure, learning techniques as facilities, students as information receivers, and

teachers as information transmitters. If students' behavior changes at least stabilize at an appropriate level, then the learning process is considered effective. Increasing kids' active involvement in all sports, including pick-up volleyball matches, can help them develop positive attitudes and behaviors (Mahedero et al., 2021).

Many issues arise while teaching volleyball in elementary schools, particularly at SD Negeri 72 Lubuklinggau. One of the main issues is that some students are learning the game for the first time and feel unprepared for it. So, when children play around and do the basics of volleyball, they often make mistakes, such as not being able to serve over the net, being afraid of the ball, complaining that their hands feel sore, and lacking motivation and enthusiasm in learning volleyball.

The methods used are inappropriate or unpleasant and the facilities and infrastructure are still minimal, making children less interested in learning to play mini volleyball, especially learning the basic techniques of playing volleyball. As a result, children become unskilled in playing volleyball, and many children cannot cross the barrier or net. This was proven when conducting an initial assessment. Of the 32 students in class VI, only 47% of the students or 15 people completed classical completion in answering the tests given, while 53% or 17 other people did not complete the answers to the tests given. This proves that student learning outcomes in the mini volleyball game material in the PJOK subject have not been achieved. If this is allowed to continue, it will certainly affect the level of student success or student achievement and indicate that there is a problem that needs to be sought for a solution to overcome this problem. Based on the observations made, there were several problems that caused the students to be less successful in carrying out the basic techniques of playing volleyball.

Some of the problems suspected to be the cause are 1) Lack of student confidence in participating in volleyball lessons; 2) The child's lack of strength in performing the bottom serve and top serve; 3) Both hands feel sore when making a downward pass; and 4) Afraid of injuring his fingers when making a top pass because he feels the ball is quite heavy (Mizoguchi et al., 2019).

From the facts above, it can be concluded that several factors cause this problem to arise, including: 1) Use of methods that are not appropriate to the learning carried out at SD Negeri 72 Lubuklinggau; 2) The facilities used are still not good; and 3) Have not used learning modifications. Based on the problems above, it is necessary to use learning methods that can help solve the problem of the basic techniques of mini

volleyball games in particular and volleyball games in general for class V I students at SD Negeri 72 Lubuklinggau so that they can perform the basic techniques of playing volleyball well and correctly, namely by taking a scientific approach.

So far, a scientific approach has never been used in teaching mini volleyball at SD Negeri 72 Lubuklinggau, Lubuklinggau City. The reasons for choosing the action of using a scientific approach are 1) When children observe pictures, children will be happier, more interested and enthusiastic in participating in learning and there are times when the results are better because children are happy with the material presented; 2) Through a scientific approach, children's characters in play will be more developed and this is the first step towards a material approach; 3) Children have a competitive nature so that their social characteristics will be more developed; and 4) Modifying the rules will allow children to be more active and creative in participating in learning and enjoy playing games that use rules.

One of the subjects taught in schools to promote the development of motor skills, physical abilities, knowledge, sportsmanship, habituation to healthy lifestyles, and character formation (mental, emotional, spiritual, and social) in order to achieve goals is physical education, according to (Yu, 2022). Conceptually speaking, the scientific method is more focused on a humanist education paradigm, which allows pupils to grow in accordance with their intellectual capacity, as mentioned in (Camuffo et al., 2019). Students become the center of learning, not objects of learning so that their character, skills and cognition can develop more optimally. To better understand the scope of the scientific approach, this paper will discuss the concept of the scientific approach, the nature of the scientific approach, the criteria for scientific and non-scientific approaches, as well as the implementation of the scientific approach in learning.

Physical education in elementary school is very important, where this is expressed in Aartun et al. (2022) states that at this time a child is in the process of optimal growth and development. Children at this period mostly focus on mastering bodily systems and functions, as well as on learning a variety of fundamental motions. It is intended that physical education would be able to assist these pupils with every step they go through. This makes it imperative that instruction be implemented carefully and precisely at the primary school unit level in order to avoid "inhibiting" efforts to "assist" in this situation.

In applying the scientific approach to learning, the learning process can be carried out using various approaches, including the scientific approach. The

application of a scientific approach in learning can start from the introductory stages, core activities, to closing activities. Where these three actions are explained in [Rini & Aldila \(2023\)](#) terms: 1) In the introduction, it is directed at strengthening students' understanding of the purpose and importance of the material to be presented, thereby generating a high level of curiosity. This curiosity is a great capital for scientists to continue their search for knowledge through empirical evidence. If students in the preliminary stages of learning have been imbued with this curiosity then it will become a big asset in the next stage of learning, namely the core activities; 2) Meanwhile, the core activity which is a learning experience for students is the time most often used to carry out learning in a scientific way. Therefore, in a learning implementation plan (RPP) an educator needs to design systematic learning activities in accordance with scientific steps. Student activities are directed at constructing concepts, knowledge, understanding and skills with the help of educators through observing, asking, reasoning, trying and communicating; 3) Meanwhile, in the closing activities students are directed to validate findings and enrich the material they have studied.

In the K13 curriculum, the learning approach is scientific, meaning that student activity in the learning process is prioritized. So the role of the media used by teachers is very large to stimulate students to be active in learning. This is caused by the method used during learning which is more directed towards lecture and command methods, the use of this method tends to be used because of the circumstances and the lack of available learning media, as well as learning that is based on material, which is not a good combination in terms of teaching materials, theory. , and teaching materials. During the learning process in a class that teaches detailed movements, carried out by observing and discussing, then students carry out these movements through their imagination, as mentioned in [Mahajan et al. \(2020\)](#), the scientific approach is operationalized in the form of learning activities which include learning experiences in the form of observing, asking, collecting activities. information (trying), reasoning (associating), and communicating. To get these five experiences.

Practically, as stated by [Abugohar et al. \(2019\)](#) the 2013 curriculum, it adheres to (1) learning carried out by teachers (taught curriculum) in the form of processes developed in the form of learning activities in schools, classes and communities; (2) students' direct learning experience (learned-curriculum) in accordance with the students' background characteristics and initial abilities. The direct learning experiences of individual students become learning outcomes for themselves, while the learning

outcomes of all students become the results of the curriculum. Based on practical concepts, learning in the context of the 2013 curriculum is learning that requires students to learn through a series of differentiated scientific work experiences. Therefore, learning in the context of the 2013 curriculum is carried out based on a scientific approach to learning combined with the principles of differentiated learning.

Volleyball is a sport that can be played by children and adults, men and women. The use of volleyball in the formation of individuals in harmonious physical and spiritual development is very significant. Volleyball playing skills will improve if they are supported by interrelated physical and spiritual abilities in carrying out playing movements. The soul is the main driver for moving the physical abilities that we already have. Mini Volleyball is a new initiative developed by Volleyball Canada to help elementary school teachers introduce volleyball to their students. Volleyball has traditionally been seen as a difficult sport to introduce to children. With a simple modification that offers mini volleyballs, teachers can easily provide their children with a fun and rewarding volleyball experience.

2. MATERIAL AND METHOD

This research started from identifying real problems related to daily learning practices faced by teachers in the classroom. PTK can be implemented if the teacher is aware from the start that there are problems related to the learning process and outcomes they face in class. The need to implement PTK will arise if teachers realize the importance of solving these problems professionally . As Mills in 11 , states that action research is defined as a systematic investigation conducted by teachers, administrators, counselors, or others with an interest in the teaching and learning process or environment to gather information about how their schools operate, how they teach, and how their students learn.

Implementation of actions is carried out in accordance with the action plan (RPP) that has been prepared. Research can make modifications to ensure the achievement of objectives. Modifications are carried out with the dynamics of the teaching and learning process, it is hoped that the student response expected by the teacher will occur. As steps in carrying out PTK 12 , it states that the steps that can be taken are a) Training teachers to do it or providing information on how to do it according to the design. This is very necessary, if what is being done is new for the teacher; b) Prepare the necessary supporting facilities and equipment in the classroom, as in the

example above, namely in the classroom there needs to be a board or place to stick, sticker paper or small pieces of paper and glue are needed; c) Prepare clear examples of orders to carry out orders; d) Prepare a way to observe the results and the tools; e) Create a scenario of what the teacher will do and what the students will do in carrying out the planned actions.

Furthermore, there are seven steps in classroom action research, namely: (1) formulating the problem (2) reviewing the literature (3) formulating the problem an action hypothesis (4) organizing the setting and taking action (5) determining evaluation criteria (6) analyzing data and evaluating results, and (7) writing reports.

The subjects in this research were class VI students at SD Negeri 72 Lubuklinggau, totaling 32 students, with details of 15 male students and 17 female students.

Next, the object of research is the learning outcomes of class VI students at SD Negeri 72 Lubuklinggau in studying the game of mini volleyball using a scientific approach.

This research was carried out in the odd semester of the 2022/2023 academic year through 2 cycles, where each cycle consists of 4 stages, namely planning, implementation/ action stage, observation/ observation stage and reflection stage. This research is classroom action research in that it is carried out in collaboration with subject teachers and carried out in two cycles. In carrying out this research, it follows and uses the John Elliot model procedure which states that one cycle consists of four main steps, namely: (1) planning, (2) action, (3) observation, (4) reflection.

3. RESULT AND DISCUSSION

The research was carried out in 2 cycles where each cycle was carried out in two meetings, each meeting consisting of 2x40 minutes. Action The learning carried out in each cycle is adjusted to the learning plan. Implementation of PJOK learning on mini volleyball game material using a scientific approach in class VI of SD Negeri 72 Lubuklinggau Odd Semester 2022/2023 Academic Year with a total of 32 students consisting of 15 male students and 17 female students. This PTK goes through four stages, namely the planning stage, implementation stage, observation stage and reflection stage. After going Through these stages, data was obtained relating to the research objective, namely to find out how to use

To obtain data in this research, several data collection techniques were used as follows: 1) Using participatory observation, namely observation ; 2) Using tests to measure the level of success of students' knowledge achievement after carrying out learning activities ; 3) Conduct interviews with questions that are explained concretely in interrogative sentences ; 4) Using documentation as accurate evidence of recording specific sources of information from the framework/writing.

The data analysis technique used in this PTK is qualitative analysis. Therefore, the appropriate data analysis technique in classroom action research is the percentage descriptive technique. This technique is used to describe quantitative and qualitative data which is interpreted in the form of descriptions.

It can be concluded that data analysis is a process of organizing and sorting data into patterns, categories, basic descriptive units so that they can be found, working hypotheses can be formulated as based on the data. The data collected is in the form of tests via pretest and posttest, as well as observations. Qualitative data analysis consists of three streams of activities that occur simultaneously, namely 1) Data Condensation; 2) Data Presentation (Data Display); 3) Conclusion Drawing. The third important analysis activity is drawing conclusions and verification. From the beginning of data collection, a qualitative analyst begins to search for the meaning of things, noting explanatory regularities, possible configurations, causal flows, and propositions. "Final" conclusions may not emerge until the end of data collection, depending on the size of the collection of field notes, their coding, storage, and retrieval methods used and the skill of the researcher.

a scientific approach to improve student learning outcomes.

In the implementation of cycle I, the activities carried out include planning, implementation, observation and reflection, with the learning activities in the RPP cycle I taking place, the teacher (researcher) gives a test with a total of 10 questions which is taken by 32 students to determine student learning outcomes, with minimum completeness. The minimum set at SD Negeri 72 Lubuklinggau is 75. The student learning test scores in cycle I (RPP I) can be seen in the following table:

Table 1. Test Results for Cycle I Class VI Students at SD Negeri 72 Lubuklinggau

Amount Score	2193
The number of students which complete	15
The number of students which no complete	17
Average value	68

From the data calculations above, it can be seen that the students' ability to answer questions in cycle 1 was less than the expected completeness criteria. Of the 32 students, only 15 students completed the classical percentage (47%) while 17 students did not complete the classical percentage (53%). From the presentation

of the learning outcome scores obtained by students, it appears that the percentage of students' classical learning completeness is only 47% with an average score obtained of 68.53. Based on the data above, classical student learning outcomes can be described as follows

Table 2. Percentage of Cycle I Classical Learning Completeness

No	Percentage Completeness Study Classical	Level Completeness	Lost Student	Amount Percentage
1	≥ 75	Complete	15	47%
2	≤ 75	No complete	17	53%
Amount			32	100%

After the learning activities in the RPP cycle II took place, the teacher (researcher) gave a test with a total of 10 questions which was taken by 32 students to determine student learning outcomes, with the minimum completeness set at SD Negeri 72 Lubuklinggau at a minimum of 75. The score of the

student learning test results in cycle II (RPP I) can be seen in the following table:

Table 3. Student Learning Results in Cycle II

Amount Score	2660
The number of students which complete	30
The number of students which no complete	2
Average value	83

From the data calculations above, it can be seen that the students' ability to answer questions in cycle II has reached the expected criteria for completeness. Of the 32 students, 94% or 30 students completed the answers to the questions given and 6% or 2 students did not complete the answers to the questions given.

From the presentation of the learning outcome scores obtained by students, it appears that the percentage of students' classical learning completeness has reached 94% with an average score obtained of 83. Based on the data above, classical student learning completeness can be described as follows:

Table 4. Results Of Cycle II Student Learning Tests

No	Percentage Completeness Study Classical	Level Completeness	Lost Student	Amount Percentage
1	≥ 75	Complete	30	94%
2	≤ 75	No complete	2	6%
Amount			32	100%

Based on the results of research during the teaching and learning process, it shows that there is an increase in students' abilities in learning front roll gymnastics with games. This is proven by the increase in student learning completion from the first cycle to the second cycle. As explained in the following table:

Table 5. Matrix Results Findings

Focus Study	Results Finding
How enhancement results Study student with using approach scientific in increase results Study student on eye lesson Social Sciences class VIII JUNIOR HIGH SCHOOL Country 1 House Jember Year Lesson 2022/2023	<p>a. Cycle I obtained mark average 68 And obtained percentage classical completeness 47% namely as many as 15 students from 32 student Which reach mark KKM (75).</p> <p>b. Activity Teacher on cycle I obtained score 28 (78%). In cycle II, scores were obtained average 83 And obtained percentage classical completeness 93% namely as many as 30 students from 32 student Which reach mark KKM (75).</p> <p>c. Activity Teacher on cycle II obtained score 28 (80%).</p>

By implementing scientific learning, student learning outcomes can be improved. This increase in results is proven from the pre-cycle stage, cycle I, cycle II. This can be shown in the following table:

Table 6. Improvement in Learning Outcomes in Cycle I and Cycle II

No	Variables Which Observed	Amount	
		Cycle I	Cycle II
1	Mark average	68	83
2	Lots student which has succeed in learning	15	30
3	Lots student Which Not yet succeed in learning	17	2
4	Percentage student Which has succeed in learning	47%	94%
5	Student percentage has not succeeded in learning	53%	6%

Based on the research results above, there are several suggestions to see and improve the quality of student learning, namely:

1. For teachers to use a scientific approach in learning that is appropriate to the material being taught and pay more attention to student learning activities so that improvement occurs, because the current reality is that there are still many students who do not understand the lessons at school.
2. For students to be more enthusiastic in learning and able to further increase their enthusiasm for learning because in using this scientific approach students are asked to group together and formulate questions so as to train them to learn, the most important fun atmosphere is created in the class.
3. As study or reference material and to increase insight for researchers who will conduct studies related to studies related to the use of a scientific approach.

CONCLUSION

The process of using a scientific approach in class VI at SD Negeri 72 Lubuklinggau was carried out in two cycles, each cycle having two meetings. In each cycle there are four stages carried out, namely the planning

stage, implementation stage, observation stage and finally the reflection stage. Each meeting has three activities, namely the first preliminary activity, the second the main activity and finally the closing activity. The results of the research that has been carried out show that there is an increase in the learning outcomes of class VI students at SD Negeri 72 Lubuklinggau using a scientific approach. This is proven by the increase in student learning outcomes starting from cycle I with an average score of 68 and increasing in cycle II with an average student score of 83. Likewise, the percentage of students who succeed in each cycle also increases, this is proven that there was an increase starting from cycle I and cycle II stages. With a percentage of success results of 47% of students in cycle I then 94% of students in cycle II. It can be concluded that the research conducted at SMP Negeri 1 Panti Jember using a scientific approach has achieved improvement or completeness of learning outcomes.

AUTHOR INFORMATION

Corresponding Authors

Hotlinder H Simamora, Rejang Lebong 1 Public Middle School, Bengkulu, Indonesia

ID <https://orcid.org/0009-0003-3884-732X>

Email: hotliderhsimamora@gmail.com

Authors

Ahmad Mahendra Adiputra, SDN 72 Lubuk Linggau, South Sumatra, Indonesia

 <https://orcid.org/0009-0006-7020-6145>
Email: amahendraadiputra@gmail.com

1851–1871.

<https://doi.org/10.1177/00315125211021812>

REFERENCE

Aartun, I., Walseth, K., Standal, Ø. F., & Kirk, D. (2022). Pedagogies of embodiment in physical education – a literature review. *Sport, Education and Society*, 27(1), 1–13. <https://doi.org/10.1080/13573322.2020.1821182>

Abugohar, M. A., Yunus, K., & Ab Rashid, R. (2019). Smartphone applications as a teaching technique for enhancing tertiary learners' speaking skills: perceptions and practices. *International Journal of Emerging Technologies in Learning*, 14(9), 74. [Google Scholar](#)

Barbu, M. C. R., Burcea, G. B., Dumitru, R., & Popescu, M. C. (2020). The Contribution of Sport to Economic and Social Development. *Studia Universitatis Babeş-Bolyai Educationis Artis Gymnasticae*, 65(1), 27–38. [https://doi.org/10.24193/subbeag.65\(1\).03](https://doi.org/10.24193/subbeag.65(1).03)

Batez, M., Petrušić, T., Bogataj, Š., & Trajković, N. (2021). Effects of Teaching Program Based on Teaching Games for Understanding Model on Volleyball Skills and Enjoyment in Secondary School Students. *Sustainability*, 13(2), 606. <https://doi.org/10.3390/su13020606>

Camuffo, A., Cordova, A., Gambardella, A., & Spina, C. (2019). A Scientific Approach to Entrepreneurial Decision Making: Evidence from a Randomized Control Trial. *Management Science*, 66(2), 564–586. <https://doi.org/10.1287/mnsc.2018.3249>

Mahajan, S., Kumar, P., Pinto, J. A., Riccetti, A., Schaaf, K., Comprodon, G., Smári, V., Passani, A., & Forino, G. (2020). A citizen science approach for enhancing public understanding of air pollution. *Sustainable Cities and Society*, 52. <https://doi.org/10.1016/j.scs.2019.101800>

Mahedero, M. P., Calderón, A., Hastie, P., & Arias-Ester, J. L. (2021). Grouping Students by Skill Level in Mini-Volleyball: Effect on Game Performance and Knowledge in Sport Education. *Perceptual and Motor Skills*, 128(4), 1851–1871. <https://doi.org/10.1177/00315125211021812>

Megawati, S., Suhairi, M., & Sari, S. (2023). Development of a Game Based Volleyball Learning Model at Sungai Kakap 21 State Elementary School. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, 7(2), 501–507. <https://doi.org/10.33369/jk.v7i2.28563>

Mizoguchi, Y., Akasaka, K., Otsudo, T., & Hall, T. (2019). Factors associated with low back pain in elite high school volleyball players. *Journal of Physical Therapy Science*, 31(8), 675–681. <https://doi.org/10.1589/jpts.31.675>

Opstoel, K., Chapelle, L., & De Martelaer, K. (2019). Personal and social development in physical education and sports: A review study. *European Physical Education Review*, 26(4), 797–813. <https://doi.org/10.1177/1356336X19882054>

Rini, E. F. S., & Aldila, F. T. (2023). Practicum Activity: Analysis of Science Process Skills and Students' Critical Thinking Skills. *Integrated Science Education Journal*, 4(2), 54–61. <https://doi.org/10.37251/isej.v4i2.322>

Rosadi, D., Rahayu, T., & Soenyoto, T. (2018). Problems with Curriculum 2013 Implementation in Physical Health Education (PJOK) of Junior High School in Sub Rayon 05 Gunungjati District Cirebon Regency. *Journal of Physical Education and Sports*, 8(1), 62–68. [Google Scholar](#)

Stojanović, D., Momčilović, V., Zadražnik, M., Ilić, I., Koničanin, A., Padulo, J., Russo, L., & Stojanović, T. (2023). School-Based TGfU Volleyball Intervention Improves Physical Fitness and Body Composition in Primary School Students: A Cluster-Randomized Trial. *Healthcare*, 11(11). <https://doi.org/10.3390/healthcare1111600>

Yu, J.-E. (2022). Exploration of Educational Possibilities by Four Metaverse Types in Physical Education. *Technologies*, 10(5), 104. <https://doi.org/10.3390/technologies10050104>

Zhe, K. Y., & Suparjoh, S. (2023). Development of Volleyball Learning Application: Fun Volley by Using Augmented Reality Technology. *Applied Information Technology And Computer Science*, 4(2), 608–627. [Google Scholar](#)